

PRELIMINARY DATA SUMMARY

October 1988

U.S. Army Engineer Waterways Experiment Station
Coastal Engineering Research Center
Field Research Facility
Duck, North Carolina

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CERC Field Research Facility
Duck, North Carolina

This report provides a summary of basic oceanographic, meteorological and bottom profile data for the month.. The data were obtained as part of the Field Research Facility Measurement and Analysis Work Unit at the U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's Field Research Facility (FRF) in Duck, North Carolina. The FRF staff collected and analyzed these data. These summaries are intended to make the data readily available to all FRF users, and comments on their content and usefulness are invited.

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PART I: INTRODUCTION

The U.S. Army Engineer Waterways Experiment Station, Coastal Engineering Research Center's (CERC's) Field Research Facility (FRF) is located on the Outer Banks of North Carolina, near the village of Duck (Figure 1).

The FRF research program provides a means for obtaining high-quality field data, particularly during storms, in support of the U.S. Army Corps of Engineers' coastal engineering research missions. The research pier is a reinforced concrete structure supported on 0.9-m-diam steel piles spaced 12.2 m apart along the pier's length and 4.6 m apart across the width. The pier deck is 6.1 m wide and extends from behind the duneline to about the 6-m water depth contour at a height 7.6 m above the National Geodetic Vertical Datum (NGVD). In addition, a main building contains offices, an instrument repair shop, and a data acquisition room.

One of the responsibilities of the FRF research program is the collection, analysis and dissemination of data on local oceanographic and meteorological conditions. Bottom profiles along both sides of the pier and periodic bathymetric surveys are also performed.

This summary is intended to provide basic data as soon as possible after they are obtained. Questions and/or comments concerning the data may be directed to Mr. Michael W. Leffler at (919) 261-3511.

Part II presents the meteorological data; Parts III through VI present oceanographic data; Part VII presents nearshore profiles and bathymetry; and Part VIII, if included, documents special events that occurred at the FRF during the month.

Table 1 is a list of instruments used, their operational status during the month, and the data collection status. Figure 2 identifies the location of the instruments. The water depths at the wave gages and current meters vary and may be determined from information contained in Figure 7. Other installation information is contained in Table 1.

Times given in the report, unless otherwise specified, are referenced to eastern standard time (EST).

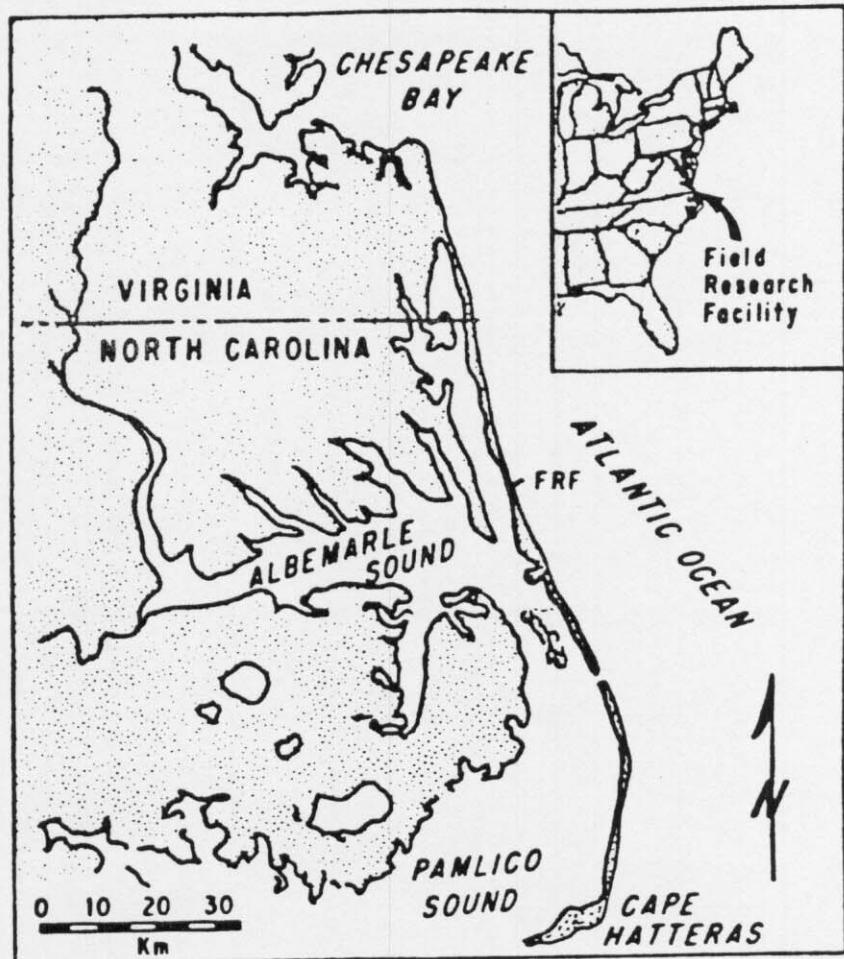


Figure 1. FRF location map

Table 1: Instrument Status/Data Availability

OCT 1988

Gage ID	Description/Remarks	Depth at Sensor		Day of the month																																		
				1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1				
616	Barometric Pressure		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
			Analog Record	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
604	Precipitation		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
624	Air Temperature		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
632	Anemometer on Laboratory Building Elevation 19 m (NGVD)		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
			Analog Record	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
645	Baylor staff at station 7+80 on FRF pier	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
625	Baylor staff at station 19+00 on FRF pier	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
111	Pressure gage 309 m north of FRF pier (0.9 km offshore)	Approx. 7.8 m NGVD	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
630	Waverider buoy 6.0 km offshore	Approx. 23 m NGVD	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	-	
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	/	-
679	Current meter 500 m south of FRF pier (0.5 km offshore)	see Figure 7	Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
			Data Collected	*	*	/	*	*	*	*	*	*	*	*	/	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
865-1370	NOAA tide station at seaward end of FRF pier		Gage Status	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
			Data Collected	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Supplemental Observations (daily oceanographic and meteorological observations)				Daily observation																																		

Gage Status	Daily Observation	Analog Record	Data Collected
Operational = *	Complete = *	Complete = *	All = *
Partial = /	Partial = /	Partial = /	Partial = /
Non-Operational = -	None = -	None = -	None = -

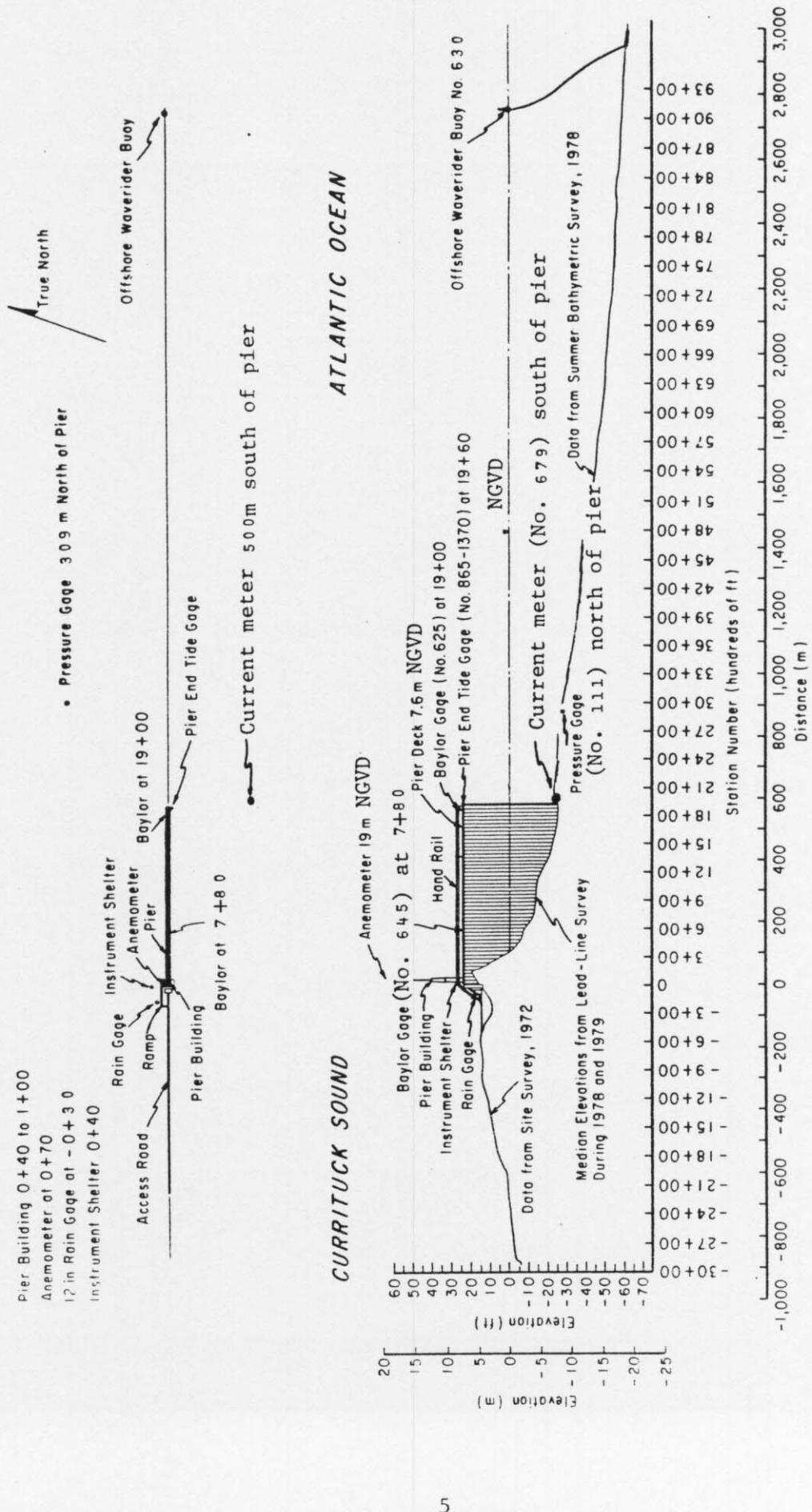


Figure 2. Instrument locations at FRF

PART II: METEOROLOGICAL DATA

A variety of instruments have been installed at the FRF (Figure 2) to monitor the meteorological conditions. The data presented in Table 2 are collected and stored on magnetic tape using a Digital Equipment Corporation VAX 11/750. For each instrument identified in Table 1 as having analog outputs, chart records are obtained, a log is maintained and the records are stored for future reference.

Winds were measured on top of the laboratory building at an elevation of 19 m (Figure 2) using a Weather Measure Skyvane anemometer.

Monthly resultant wind speeds and directions are determined by vector averaging the data. Temperature and atmospheric means are the average of the values presented for the month. Total precipitation is the sum for the month.

The following may be useful for converting the data in Table 2 to other frequently used units of measurement:

1. Millimeters (mm) to inches (in.) -
 $mm \times .03937 = in.$
2. Millibars (mb) to inches of mercury (in. Hg) -
 $mb \times 0.02953 = in. Hg$
3. Degrees Celsius (C) to degrees Fahrenheit (F) -
 $(C \times 9/5) + 32 = F$
4. Meters per second (m/s) to knots (kn) -
 $m/s \times 1.943 = kn$

Table 2: Meteorological Data

Oct 1988

Day	Hour	Wind Speed m/sec	Wind Direction deg TN	Temperature deg C	Atm Pressure mb	Precipitation
						mm
1	100	4	38	19.5	1022.6	0
	700	5	45	20.0	1022.3	0
	1300	4	52	22.8	1020.9	0
	1900	3	76	20.1	1019.2	0
2	100	3	145	19.2	1017.2	0
	700	3	138	21.2	1016.2	0
	1300	8	119	24.8	1013.8	0
	1900	5	179	24.0	1013.1	0
3	100	3	202	23.2	1012.1	0
	700	3	40	21.9	1011.4	0
	1300	5	355	22.1	1010.4	17
	1900	10	25	20.3	1011.1	0
4	100	10	30	20.4	1009.4	0
	700	16	14	18.8	1008.1	8
	1300		UPS inoperative		1008.1	0
	1900	13	2	18.5	1012.5	0
5	100	9	5	17.7	1014.5	0
	700	4	310	15.7	1017.9	0
	1300	4	26	18.7	1019.6	0
	1900	5	36	17.3	1021.9	0
6	100	7	18	16.3	1023.3	0
	700	9	19	15.5	1025.7	0
	1300	7	18	16.3	1026.0	0
	1900	8	32	15.3	1025.7	0
7	100	11	37	16.0	1024.3	0
	700	12	23	15.2	1023.3	0
	1300	13	1	12.6	1021.6	4
	1900	12	346	13.8	1020.9	4
8	100	15	349	12.6	1019.2	0
	700	7	300	9.5	1018.6	0
	1300	8	331	14.7	1018.6	0
	1900	10	359	13.6	1019.6	0
9	100	4	306	10.9	1020.6	0
	700	3	325	11.9	1020.9	0
	1300	4	26	15.4	1020.9	0
	1900	6	68	14.1	1019.2	0
10	100	4	298	11.5	1017.5	0
	700	2	270	12.2	1016.2	0
	1300	3	204	18.1	1012.8	0
	1900	4	179	14.9	1010.4	0
11	100	8	233	14.8	1008.7	0
	700	7	228	14.2	1009.1	0
	1300	6	233	19.5	1008.1	0
	1900	3	218	17.5	1009.4	0
12	100	10	11	16.9	1011.1	0
	700	9	359	14.7	1014.5	0
	1300	8	5	14.7	1015.9	0
	1900	8	354	13.2	1018.6	0
13	100	6	322	9.5	1022.3	0
	700	8	317	8.0	1024.3	0
	1300	7	331	11.8	1024.7	0
	1900	4	324	9.5	1025.7	0
14	100	5	299	8.2	1027.4	0
	700	5	299	8.3	1028.0	0
	1300		Preventive Maintenance		1026.7	0
	1900	4	197	11.7	1024.7	0
15	100	3	213	10.5	1024.3	0
	700	4	234	12.0	1024.0	0
	1300	3	202	17.6	1022.6	0
	1900	3	176	13.8	1022.3	0
16	100	4	227	13.2	1022.6	0
	700	1	177	14.0	1023.3	0
	1300	4	85	19.8	1022.3	0
	1900	3	139	17.7	1021.9	0

(Continued)

(Sheet 1 of 2)

Table 2: Meteorological Data

Oct 1988

Day	Hour	Wind	Wind	Temperature	Atm	Precipitation
		Speed m/sec	Direction deg TN	deg C	mb	mm
17	100	1	94	16.8	1021.9	0
	700	2	16	17.1	1022.6	0
	1300	2	15	20.3	1021.3	0
	1900	2	78	18.0	1019.9	0
18	100	3	214	15.5	1018.6	0
	700	3	219	16.1	1017.9	0
	1300	5	195	23.2	1013.1	0
	1900	6	190	18.7	1012.1	0
19	100	4	332	17.3	1011.8	0
	700	13	6	13.9	1013.1	7
	1300	7	349	13.9	1012.5	8
	1900	3	318	12.6	1015.2	0
20	100	5	315	12.7	1016.9	0
	700	5	310	12.0	1019.6	0
	1300	5	16	14.4	1020.3	0
	1900	5	44	13.7	1021.6	0
21	100	5	71	14.9	1020.6	0
	700	7	33	15.5	1018.6	0
	1300	5	128	18.3	1010.8	0
	1900	7	237	17.1	1004.3	20
22	100	8	275	11.8	1003.7	0
	700	8	254	11.1	1003.7	0
	1300	9	257	16.1	1002.0	0
	1900	8	246	13.4	1006.7	0
23	100	7	293	10.4	1009.4	0
	700	4	265	10.4	1012.1	0
	1300	4	230	14.6	1011.1	0
	1900	4	168	11.7	1009.8	0
24	100	4	204	13.2	1008.7	0
	700	5	192	14.8	1007.4	0
	1300	4	202	17.4	1004.3	0
	1900	1	324	14.4	1004.3	0
25	100	7	281	13.4	1007.4	0
	700	7	286	10.8	1011.8	0
	1300	4	250	15.5	1011.4	0
	1900	4	163	12.3	1012.1	0
26	100	7	233	13.3	1012.5	0
	700	4	265	12.0	1013.8	0
	1300	5	232	15.6	1012.5	0
	1900	3	251	13.0	1014.8	0
27	100	2	209	11.2	1017.2	0
	700	2	298	11.0	1019.9	0
	1300	2	62	17.4	1021.3	0
	1900	6	107	15.2	1021.9	0
28	100	6	108	15.8	1020.6	0
	700	3	183	16.6	1020.3	0
	1300	System down for repair			1015.5	0
	1900	5	223		1016.9	0
29	100	6	307		1018.2	0
	700	11	20		1021.9	0
	1300	7	16	13.7	1022.6	0
	1900	6	27	13.0	1022.6	0
30	100	6	24	13.6	1021.6	0
	700	10	20	14.0	1022.3	0
	1300	8	4	14.2	1022.3	0
	1900	9	13	12.6	1023.6	0
31	100	9	40	11.9	1024.0	0
	700	9	47	12.1	1024.3	0
	1300	8	48	13.2	1022.3	0
	1900	8	40	14.1	1019.6	0
		Resultant		Mean	Mean	Total
		2	351	15.1	1017.1	68

(Sheet 2 of 2)

PART III: WAVE DATA

Wave data are collected from two Baylor staff gages (Gages 625 and 645), a pressure wave gage (Gage 111) and a Waverider buoy (Gage 630) as shown in Table 1 and Figure 2. The data are collected, analyzed, and stored on magnetic tape using a Digital Equipment Corporation VAX 11/750 programmed to sample the wave gages every 6 hrs (more frequently during storms) near 0100, 0700, 1300, and 1900 EST. The sampling rate is two times per second for 34 minutes.

Wave height H_{mo} is an energy-based statistic equal to four times the standard deviation of the sea surface elevations. Wave height reported from the pressure gage has been compensated for hydrodynamic attenuation using linear wave theory. Wave period is identified from the computation of a variance (energy) spectrum with 60 deg of freedom calculated from a 34-min record. Peak wave period T_p is defined as the period associated with the maximum energy in the spectrum. When this analysis is complete, the data are written to magnetic tape.

Table 3 presents the wave heights and periods for each wave record obtained at 6 hr intervals during the month. The monthly means and standard deviations from the means shown in Table 3 are average values computed from this data. Figure 3 is a time history of all H_{mo} and T_p values obtained for all gages.

Differences in wave periods between wave gages (Table 3 and Figure 3) may be the result of wave breaking, wave reformation, or the presence of multiple wave trains containing nearly equal energy.

Table 3: Wave Data

Oct 1988

Day	Hour	645		625		111		630	
		Baylor	at 7+80	Baylor	at 19+00	Pressure Gage		Farshr	Wvldr
		Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec	Hmo,m	T,sec
1	0100	0.55	11.13	0.95	8.53	0.94	9.85	0.97	8.26
	0700	0.53	12.19	0.84	9.14	0.85	9.48	0.86	8.53
	1300	0.46	11.13	0.73	9.85	0.70	10.67	0.77	11.13
	1900	0.42	11.13	0.65	8.53	0.70	8.00	0.74	9.48
2	0100	0.39	11.13	0.63	11.13	0.70	11.13	0.75	11.13
	0700	0.42	10.24	0.60	9.48	0.71	9.85	0.78	9.48
	1300	0.45	9.48	0.62	9.14	0.69	9.48	0.85	8.83
	1900	0.46	8.26	0.62	9.14	0.72	8.26	0.89	8.26
3	0100	0.42	9.48	0.66	8.83	0.73	8.26	0.81	8.53
	0700	0.48	9.14	0.68	9.14	0.80	9.14	0.86	9.14
	1300	0.53	9.14	0.73	9.14	0.73	9.14	0.87	5.82
	1900	0.89	4.27	1.00	9.14	1.05	9.14	1.13	4.13
4	0100	1.32	6.24	1.35	5.82	1.59	5.82	1.54	6.09
	0700	1.36	6.40	1.88	6.24	1.91	6.74	2.21	6.09
	1300	UPS inoperative							
	1900	1.34	8.00	2.13	8.26	2.38	8.26	2.42	8.26
5	0100	1.39	7.76	1.75	8.83	1.84	8.53	1.97	8.83
	0700	1.20	8.00	1.48	9.14	1.44	8.53	1.57	8.00
	1300	1.17	9.14	1.42	10.24	1.46	9.85	1.50	9.48
	1900	1.02	9.85	1.21	9.48	1.30	9.85	1.26	9.48
6	0100	0.96	9.48	1.26	9.48	1.27	9.14	1.28	9.14
	0700	1.08	5.12	1.27	11.13	1.30	10.67	1.28	10.67
	1300	0.96	5.57	1.20	10.24	1.24	10.67	1.26	5.22
	1900	0.84	10.67	1.07	9.48	1.07	10.24	1.08	9.85
7	0100	1.10	4.57	1.30	4.49	1.34	4.66	1.39	4.83
	0700	1.14	5.12	1.38	4.83	1.35	4.83	1.41	5.02
	1300	1.33	6.24	1.76	5.69	1.73	5.95	1.95	5.82
	1900	1.42	5.95	1.63	5.95	1.81	5.57	1.95	5.95
8	0100	1.29	7.31	1.98	6.56	1.97	6.92	2.56	6.92
	0700	1.54	7.11	1.90	6.56	1.93	6.74	2.33	7.76
	1300	1.13	9.48	1.89	9.85	1.91	8.83	1.96	8.83
	1900	1.41	10.24	1.77	11.13	1.83	11.13	1.71	10.24
9	0100	1.17	12.80	1.81	11.64	1.87	12.80	1.80	11.13
	0700	1.31	12.80	1.53	11.64	1.58	12.19	1.76	11.64
	1300	1.25	12.80	1.72	12.80	1.84	13.47	1.61	13.47
	1900	1.30	13.47	1.59	13.47	1.49	12.19	1.43	12.19
10	0100	1.03	13.47	1.46	13.47	1.56	12.19	1.28	12.19
	0700	0.76	12.80	1.20	12.19	1.12	12.19	1.03	12.19
	1300	0.66	12.19	0.96	12.19	1.06	11.64	0.96	11.64
	1900	0.47	11.64	0.88	11.13	0.87	11.13	0.79	11.13
11	0100	0.28	11.13	0.64	11.13	0.71	11.13	0.70	10.67
	0700	0.21	11.13	0.36	11.13	0.47	10.67	0.49	10.67
	1300	0.16	10.24	0.33	9.85	0.33	10.24	0.34	9.85
	1900	0.25	3.82	0.33	9.48	0.36	8.53	0.40	9.48
12	0100	0.37	2.67	0.39	2.64	0.29	13.47	0.51	2.98
	0700	0.90	4.57	1.11	4.83	1.11	4.57	1.13	4.74
	1300	0.83	5.45	1.03	5.57	1.03	5.57	1.21	5.82
	1900	0.83	5.22	0.96	5.12	0.93	5.22	1.00	5.22
13	0100	0.90	5.95	1.12	5.82	1.14	5.57	*	*
	0700	1.06	5.95	1.14	6.40	1.16	5.45	*	*
	1300	0.87	6.09	0.89	5.69	0.90	6.09	1.41	5.45
	1900	0.92	5.95	0.94	6.09	0.90	6.56	1.25	6.24
14	0100	0.89	6.56	0.83	5.45	0.89	6.56	1.06	5.95
	0700	0.73	5.95	0.68	5.82	0.69	5.82	0.81	5.45
	1300	Preventive Maintenance							
	1900	0.48	5.45	0.52	5.82	0.56	5.95	0.65	5.82
15	0100	0.28	5.57	0.35	5.69	0.37	7.53	0.43	8.53
	0700	0.16	8.83	0.26	7.76	0.29	8.53	0.34	8.83
	1300	0.15	9.48	0.23	9.48	0.27	9.14	0.27	9.14
	1900	0.21	8.83	0.27	8.26	0.29	8.83	0.41	2.94
16	0100	0.17	12.19	0.25	8.53	0.28	8.26	0.31	8.83
	0700	0.18	11.64	0.29	8.00	0.33	8.53	0.31	7.76
	1300	0.18	11.13	0.27	11.64	0.31	8.83	0.36	10.24
	1900	0.20	10.24	0.30	10.24	0.37	10.24	0.35	10.24

* Electronic problems

(Continued)

(Sheet 1 of 2)

Table 3: Wave Data

Oct 1988

Day	Hour	645		625		111		630	
		Baylor at 7+80	Hmo, m	Baylor at 19+00	Hmo, m	Pressure Gage	Hmo, m	Farshr	Wvrdr
		T, sec	T, sec	T, sec	T, sec	T, sec	T, sec	T, sec	
17	0100	0.23	9.48	0.37	10.67	0.42	10.67	0.47	10.67
	0700	0.34	9.48	0.47	10.67	0.52	10.24	0.60	10.67
	1300	0.44	9.85	0.57	9.14	0.68	9.85	0.72	9.85
	1900	0.48	8.83	0.67	9.14	0.74	9.14	0.85	9.48
18	0100	0.51	8.53	0.76	8.83	0.83	8.83	0.87	8.00
	0700	0.62	8.83	0.82	8.83	0.92	9.85	0.96	9.14
	1300	0.52	10.24	0.81	9.85	0.85	9.48	0.92	9.14
	1900	0.52	10.24	0.81	10.24	0.85	9.85	0.99	10.67
19	0100	0.58	10.24	0.95	11.13	1.02	10.24	1.03	10.67
	0700	1.02	5.12	1.68	4.66	1.78	11.13	*	
	1300	1.12	5.45	1.40	11.64	1.43	11.13	1.53	11.13
	1900	0.95	12.80	1.25	12.19	1.21	12.80	1.13	12.19
20	0100	0.95	12.80	1.22	12.80	1.30	12.80	1.26	12.19
	0700	0.87	12.80	1.14	12.80	1.22	12.80	1.25	12.80
	1300	0.85	12.19	1.13	12.19	1.17	11.64	1.22	12.19
	1900	0.76	13.47	0.95	12.80	1.03	12.80	1.01	12.80
21	0100	0.75	11.64	0.98	11.64	0.99	12.19	0.97	11.13
	0700	0.76	12.80	0.97	11.64	0.97	12.19	1.06	12.19
	1300	0.81	5.33	1.11	11.13	1.09	11.13	1.18	11.13
	1900	0.87	5.69	1.17	6.09	1.18	6.09	1.47	5.95
22	0100	0.71	7.76	0.97	8.00	1.03	7.76	1.32	8.26
	0700	0.55	9.48	0.76	9.48	0.77	10.24	0.95	10.24
	1300	0.54	10.67	0.81	10.67	0.84	10.67	0.98	10.67
	1900	0.46	13.47	0.69	11.13	0.80	13.47	0.76	8.83
23	0100	0.47	12.19	0.67	11.64	0.62	11.64	0.75	11.13
	0700	0.37	10.67	0.52	11.13	0.54	10.67	0.58	10.67
	1300	0.30	11.13	0.42	9.48	0.47	11.64	0.44	10.24
	1900	0.31	11.64	0.45	11.13	0.50	11.64	0.48	11.64
24	0100	0.38	14.22	0.50	10.67	0.50	10.24	0.55	11.13
	0700	0.31	14.22	0.46	14.22	0.49	13.47	0.58	10.24
	1300	0.27	12.80	0.36	12.80	0.45	12.80	0.46	12.80
	1900	0.35	12.19	0.47	12.80	0.51	12.80	0.55	12.19
25	0100	0.31	12.19	0.44	12.19	0.46	12.19	0.64	11.64
	0700	0.42	17.07	0.53	17.07	0.53	12.19	0.63	12.19
	1300	0.54	17.07	0.54	16.00	0.54	16.00	0.61	11.13
	1900	0.35	16.00	0.47	16.00	0.55	16.00	0.55	16.00
26	0100	0.35	15.06	0.49	15.06	0.53	15.06	0.67	14.22
	0700	0.29	14.22	0.42	14.22	0.49	14.22	0.54	14.22
	1300	0.27	13.47	0.41	13.47	0.44	13.47	*	
	1900	0.28	13.47	0.44	13.47	0.50	13.47	0.54	13.47
27	0100	0.32	12.80	0.40	12.80	0.48	12.80	0.46	12.19
	0700	0.27	12.19	0.40	12.19	0.50	12.19	0.48	12.19
	1300	0.74	4.92	0.69	12.19	0.69	4.92	*	
	1900	0.50	4.13	0.60	11.13	0.56	11.64	0.63	11.64
28	0100	0.56	3.88	0.63	11.64	0.57	11.64	0.63	11.13
	0700	0.35	10.67	0.48	10.67	0.50	10.67	0.58	10.67
	1300	System down for repair							
	1900	0.43	4.34	0.53	11.64	0.54	10.67	0.82	4.66
29	0100	0.32	11.13	0.39	11.64	0.45	11.64	0.73	5.02
	0700	1.12	5.95	1.43	5.95	1.46	5.95	1.54	6.24
	1300	0.98	6.40	1.15	6.40	1.14	6.40	*	
	1900	0.80	5.95	0.83	5.57	0.80	5.57	0.99	6.24
30	0100	0.71	6.56	0.75	6.56	0.70	6.74	0.92	6.40
	0700	0.84	5.22	0.98	4.34	0.94	4.20		
	1300	0.83	5.22	1.00	5.33	1.00	5.22		
	1900	0.90	4.74	1.03	4.92	1.01	4.74	Gage	
31	0100	1.01	5.33	1.21	5.33	1.15	5.45	Inoperative	
	0700	0.96	5.82	1.14	5.95	1.11	6.24		
	1300	0.88	5.22	1.02	5.33	1.02	5.45		
	1900	0.92	5.57	1.10	5.82	1.05	5.82		
Mean		0.69	9.22	0.90	9.48	0.93	9.56	0.99	9.34
Std dev		0.36	3.30	0.46	2.94	0.46	2.78	0.50	2.68

* Electronic problems

(Sheet 2 of 2)

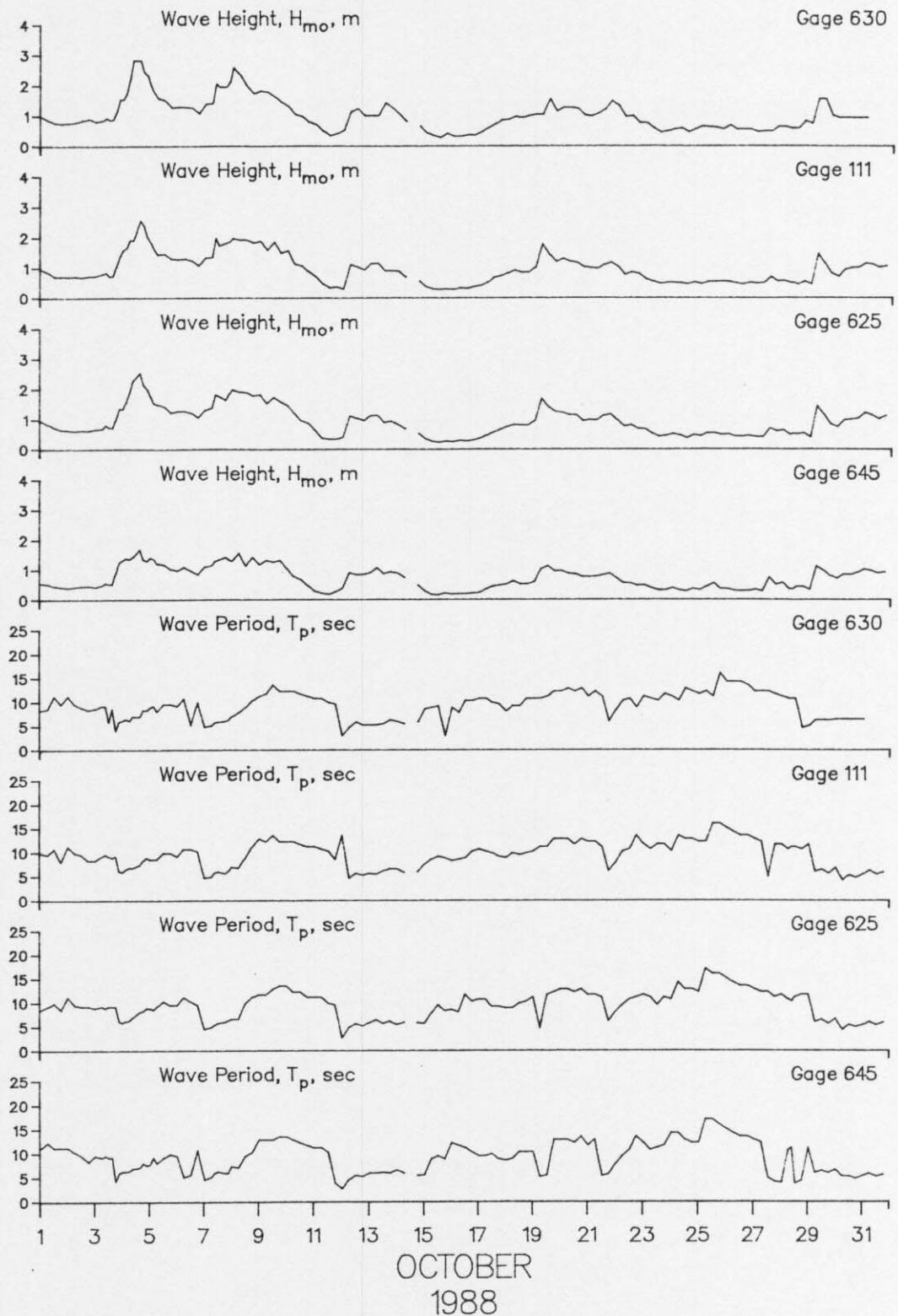


Figure 3. Time history of wave heights and periods

PART IV: CURRENT DATA

Current data (Table 4) are collected from a Marsh-McBirney electromagnetic biaxial current meter (Table 1 and Figure 2) and by visually observing the movement of dye on the water surface in the surf and at the seaward end of the pier, as well as 500 m updrift of the pier 12 m offshore.

Since the shoreline orientation is approximately N20W, longshore currents flow either toward 340 deg (i.e. northward) or toward 160 deg (i.e. southward). Similarly, cross-shore currents are either onshore (westward) or offshore (eastward).

All current speeds are given in centimeters per second (cm/sec). Resultant speeds and directions are determined by vector averaging the data.

Table 4: Current Data
Oct 1988

Alongshore Cross-shore Resultant Time Day	Pier Measurements				Beach Measurements (500m Updrift)				Current Meter at South Tripod Depth -4.8m (NGVD) ID #679	
	Dye at (579 m) (surface) Speed	Dir	Dye at Mid-Surf Zone (surface) Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface) Location	Speed	Dir	Speed	Dir
1 0100-Along Cross Result									8	S
1 0700-Along Cross Result	0			41	N		0		5	off
1 1300-Along Cross Result	0	0	189	24	on	South			9	128
1 1900-Along Cross Result				47	309				0	
2 0100-Along Cross Result									1	N
2 0700-Along Cross Result	38	N		44	N		34	N	1	on
2 1300-Along Cross Result	0		177	39	on	South			1	295
2 1900-Along Cross Result	38	340		59	298				5	N
3 0100-Along Cross Result									3	on
3 0700-Along Cross Result	0			44	N		41	N	6	309
3 1300-Along Cross Result	0	0	189	39	on	South			14	328
3 1900-Along Cross Result				59	298				5	N
4 0100-Along Cross Result									3	on
4 0700-Along Cross Result	102	S		102	S		55	S	17	317
4 1300-Along Cross Result	30	on	226	0		North			2	off
4 1900-Along Cross Result	106	177		102	160				17	347
5 0100-Along Cross Result									0	
5 0700-Along Cross Result									0	
5 1300-Along Cross Result	36	S		38	S		64	S	29	S
5 1900-Along Cross Result	11	off	177	0		North			4	on
	37	143		38	160				29	168

KEY = All speeds in CM/SEC
 N = Northward, Shore parallel
 S = Southward, Shore parallel
 on = onshore off = offshore

Table 4: Current Data (Continued)
Oct 1988

Alongshore Cross-shore Resultant Time Day	Pier Measurements				Beach Measurements (500m Updrift)				Current Meter at South Tripod Depth -4.8m (NGVD) ID #679	
	Dye at (579 m) (surface) Speed	Dir	Dye at Mid-Surf Zone (surface) Distance from Baseline (m)		Dye 12m offshore (surface) Location	Speed	Dir	Speed	Dir	
6 0100-Along Cross Result								17	S	
6 0700-Along Cross Result	47	S		87	S			2	off	
	0		152	17	on	North	30	S		
	47	160		89	171			17	153	
6 1300-Along Cross Result								28	S	
6 1900-Along Cross Result								1	off	
								28	158	
7 0100-Along Cross Result								7	S	
7 0700-Along Cross Result	44	S		76	S			0		
	52	on	165	23	on	North	61	S		
	68	210		80	177			7	160	
7 1300-Along Cross Result								19	S	
7 1900-Along Cross Result								1	on	
								19	163	
8 0100-Along Cross Result								16	S	
8 0700-Along Cross Result	61	S		76	S			1	off	
	18	on	152	23	on	North	55	S		
	64	177		80	177			28	158	
8 1300-Along Cross Result								31	S	
8 1900-Along Cross Result								3	off	
								31	154	
9 0100-Along Cross Result								33	S	
9 0700-Along Cross Result	32	S		41	S			4	off	
	5	on	152	0	on	North	43	N		
	32	169		41	160			8	164	
9 1300-Along Cross Result								1	S	
9 1900-Along Cross Result								8	off	
								8	153	
10 0100-Along Cross Result								14		
10 0700-Along Cross Result	10	N		15	N			1	on	
	0		179	25	off	South	0			
	10	340		29	40			8	333	
10 1300-Along Cross Result								14	N	
10 1900-Along Cross Result								4	off	
								15	356	
								18	N	
								5	on	
								19	324	

KEY = All speeds in CM/SEC

N = Northward, Shore parallel

S = Southward, Shore parallel

on = onshore off = offshore

Table 4: Current Data (Continued)
Oct 1988

Alongshore Cross-shore Resultant Time	Pier Measurements				Beach Measurements (500m Updrift)			Current Meter at South Tripod Depth -4.8m (NGVD) ID #679		
	Day	Dye at (579 m) (surface)	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed	Dir
11 0100-Along Cross Result									17	N
									6	on
									18	321
11 0700-Along Cross Result		36 N 5 off 36 349		140	20 7 22	N off 359		3 N South	19 4 19	N on 328
11 1300-Along Cross Result									15 5 16	N on 322
11 1900-Along Cross Result									12 4 13	N on 322
12 0100-Along Cross Result									0 1 1	
									1	on
12 0700-Along Cross Result		30 S 5 on 31 169		152	55 0 55	S 160		96 S North	12 3 12	S off 146
12 1300-Along Cross Result									22 14 26	S off 128
12 1900-Along Cross Result									7 7 10	S off 115
13 0100-Along Cross Result									20 2 20	S off 154
									19 2 19	
13 0700-Along Cross Result		36 S 5 off 36 151		165	23 4 24	S off 151		40 S North	28 5 28	S off 154
13 1300-Along Cross Result									16 3 16	S off 149
13 1900-Along Cross Result									16 4 16	S off 146
14 0100-Along Cross Result									9 2 9	
									2	off
14 0700-Along Cross Result		15 S 4 off 15 143		152	29 6 30	S off 149		28 S North	9 2 9	S off 147
14 1300-Along Cross Result									4 4 6	
14 1900-Along Cross Result									2 1 2	N off 7
15 0100-Along Cross Result									4 5 10	S on 311
									6 0 6	
15 0700-Along Cross Result		16 N 7 off 17 4		152	6 0 6	N 0 340		37 N South	9 5 10	N on 311
15 1300-Along Cross Result									6 0 6	N off 340
15 1900-Along Cross Result									5 4 6	N on 301

KEY = All speeds in CM/SEC
N = Northward, Shore parallel
S = Southward, Shore parallel
on = onshore off = offshore

Table 4: Current Data (Continued)
Oct 1988

Day	Alongshore Cross-shore Resultant Time	Pier Measurements				Beach Measurements (500m Updrift)			Current Meter at South Tripod Depth -4.8m (NGVD) ID #679		
		Dye at (579 m) (surface)	Speed	Dir	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed
16 0100	Along Cross Result								0	South	2
16 0700	Along Cross Result	16 8 on	N 140		5 3 on	N 3 on			0		3
16 1300	Along Cross Result	17 313			5 309						4
16 1900	Along Cross Result										284
17 0100	Along Cross Result										5
17 0700	Along Cross Result	14 6 on	N 165		28 0	N 340			55 N	South	4
17 1300	Along Cross Result	15 316			28						216
17 1900	Along Cross Result										1
18 0100	Along Cross Result										5
18 0700	Along Cross Result	15 4 off	N 177		61 15	N on			59 N	South	1
18 1300	Along Cross Result	16 354			63 326						0
18 1900	Along Cross Result										1
19 0100	Along Cross Result										160
19 0700	Along Cross Result	30 9 on	S 165		68 0	S 160			7 N	North	5
19 1300	Along Cross Result	32 177			68						4
19 1900	Along Cross Result										6
20 0100	Along Cross Result										216
20 0700	Along Cross Result	24 1 off	S 165		41 24	S off			17 S	North	3
20 1300	Along Cross Result	24 157			47 129						0
20 1900	Along Cross Result										3

KEY = All speeds in CM/SEC
 N = Northward, Shore parallel
 S = Southward, Shore parallel
 on = onshore off = offshore

Table 4: Current Data (Continued)
Oct 1968

Alongshore Cross-shore Resultant ---- Time	Pier Measurements				Beach Measurements (500m Updrift)				Current Meter at South Tripod				
	Dye at (579 m) (surface)	Speed	Dir	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed	Dir	Depth -4.8m (NGVD)	ID #679
Day													
21 0100-Along Cross Result										1	S		
										2	off		
										2	97		
21 0700-Along Cross Result	14	S			28	S		5	N	15	S		
	4	on		165	8	off		North		3	off		
	14	177			29	143				15	149		
21 1300-Along Cross Result										2	S		
										0			
										2	160		
21 1900-Along Cross Result										15	N		
										4	on		
										16	325		
22 0100-Along Cross Result										6	N		
										4	on		
										7	306		
22 0700-Along Cross Result	7	S			61	N		0		3	S		
	6	off		152	9	on		North		1	on		
	9	118			62	331				3	178		
22 1300-Along Cross Result										8	N		
										5	on		
										9	308		
22 1900-Along Cross Result										5	N		
										2	on		
										5	318		
23 0100-Along Cross Result										4	N		
										3	on		
										5	303		
23 0700-Along Cross Result	6	N			0			37	N	4	N		
	1	off		140	2	off		South		0			
	6	349			2	70				4	340		
23 1300-Along Cross Result										15	N		
										3	on		
										15	329		
23 1900-Along Cross Result										12	N		
										1	on		
										12	335		
24 0100-Along Cross Result										17	N		
										2	on		
										17	333		
24 0700-Along Cross Result	28	S			9	N		4	S	13	N		
	6	off		140	5	off		South		2	on		
	28	149			10	11				13	331		
24 1300-Along Cross Result										0			
										1	on		
										1	250		
24 1900-Along Cross Result										7	N		
										3	on		
										8	317		
25 0100-Along Cross Result										8	N		
										3	on		
										9	319		
25 0700-Along Cross Result	18	S			13	S		32	S	6	S		
	3	off		140	8	off		North		0			
	19	151			15	129				6	160		
25 1300-Along Cross Result										6	S		
										0			
										6	160		
25 1900-Along Cross Result										7	N		
										2	on		
										7	324		

KEY = All speeds in CM/SEC
N = Northward, Shore parallel
S = Southward, Shore parallel
on = onshore off = offshore

Table 4: Current Data (Continued)
Oct 1988

Alongshore Cross-shore Resultant Time	Pier Measurements						Beach Measurements			Current Meter at South Tripod Depth -4.8m (NGVD) ID #679	
	Dye at (579 m) (surface)	Speed	Dir	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed	Dir	Dye 12m offshore (surface)	Location	Speed	Dir
Day											
26 0100-Along Cross Result										17	N
26 0700-Along Cross Result	20 0	N 340		0	140	0		0	South	3	on
26 1300-Along Cross Result	20			0		0	0			14	330
26 1900-Along Cross Result										2	on
27 0100-Along Cross Result										14	332
27 0700-Along Cross Result	3 1 3	N on 331		4	140	0	S	15	N	4	N
27 1300-Along Cross Result				0		4	160		North	2	off
27 1900-Along Cross Result										4	7
28 0100-Along Cross Result										6	N
28 0700-Along Cross Result	23 7 24	N off 357		16	140	3	N off	29	N	1	331
28 1300-Along Cross Result				17		351			South	1	160
28 1900-Along Cross Result										1	160
29 0100-Along Cross Result										3	S
29 0700-Along Cross Result	34 3 34	S on 166		76	152	8 off		18	S	5	off
29 1300-Along Cross Result				77		154			North	20	149
29 1900-Along Cross Result										19	S
30 0100-Along Cross Result										5	off
30 0700-Along Cross Result	15 4 15	S on 174		41	152	0	N	14	S	20	145
30 1300-Along Cross Result				41		160				8	S
30 1900-Along Cross Result										1	off

KEY = All speeds in CM/SEC
 N = Northward, Shore parallel
 S = Southward, Shore parallel
 on = onshore off = offshore

Table 4: Current Data (Concluded)
Oct 1988

Alongshore Cross-shore Resultant ----- Time	Pier Measurements				Beach Measurements (500m Updrift)			Current Meter at South Tripod	
	Dye at (579 m) (surface)	Dye at Mid-Surf Zone (surface)	Distance from Baseline (m)	Speed Dir	Dye 12m offshore (surface)	Location	Speed Dir	Depth -4.8m (NGVD)	ID #679
Day	Speed	Dir						Speed	Dir
31 0100-Along Cross Result								20	S
								4	off
								20	149
31 0700-Along Cross Result	15	S		29 S		33 S		12	S
	5	on	152	0		North		3	off
	16	177		29 160				12	146
31 1300-Along Cross Result								12	S
								4	off
								13	142
31 1900-Along Cross Result								2	S
								3	off
								4	104

KEY = All speeds in CM/SEC
 N = Northward, Shore parallel
 S = Southward, Shore parallel
 on = onshore off = offshore

PART V: SUPPLEMENTAL OBSERVATIONS

Visual wave direction measurements (Table 5) taken at the seaward end of the pier are made of both the primary wave train (i.e. that having the larger wave heights) and the secondary wave train (which must be clearly distinguishable as a wave train separate from the primary waves but not surface chop or capillary waves). The direction of the primary wave train just north of the seaward end of the pier is also determined using a Raytheon Marine Pathfinder radar and measuring the alignment of the wave crests. The pier axis (considered perpendicular to the beach at the FRF) is orientated 70 deg east of true north; consequently, wave angles greater than 70 deg indicate that the waves were coming from the south side of the pier.

The width of the surf zone (seawardmost breaker position to shoreline) is determined from the pier deck.

Measurements of surface water temperature, density, and visibility are made daily at the seaward end of the FRF pier. A jar along with a thermometer is lowered about 0.3 m into the water and allowed to remain for at least one minute. The jar is removed, the temperature read, and a hydrometer is used to determine the density. A Secchi disc is used to determine the surface visibility.

Table 5: Supplemental Observations

Oct 1988

Day	Time	Wave Approach Angle at Pier End deg from True N		Radar Wave Angle deg from True N	Width of Surf Zone, m	Water Characteristics at Pier End		
		Primary	Secondary			Temp., C	Density g/cc	Secchi Vis., m
1	0720	85		65	73	22.2	1.0218	1.8
2	0823	90		95	43	22.5	1.0216	3.4
3	0722	90		55	49	21.4	1.0246	1.2
4	0706	60		30	79	21.1	1.0234	0.9
5	0725	60		45	98	20.5	1.0210	0.9
6	0705	35		65	146	20.0	1.0212	0.9
7	0729	60		60	122	18.9	1.0220	0.9
8	0907	10		35	171	17.8	1.0220	0.9
9	0815	70		60	122	17.7	1.0220	0.9
10	0827	75			158	18.4	1.0214	1.2
11	0708	85			73	18.9	1.0240	0.6
12	0731	20		20	37	18.4	1.0242	0.9
13	0712	30		35	146	15.6	1.0248	0.9
14	0717	30		60	98	16.1	1.0230	1.5
15	0606	none visible			37	15.6	1.0228	2.1
16	0927	none visible			18	17.2	1.0238	2.1
17	0732	95	80		85	17.2	1.0236	3.0
18	0620	90	100		85	17.2	1.0238	2.4
19	0753	10		30	171	16.7	1.0244	0.9
20	0722	70	35	80	134	16.7	1.0246	1.5
21	0739	55		60	122	16.7	1.0246	2.7
22	0804	50			79	16.7	1.0244	2.1
23	0718	0			37	16.2	1.0246	2.1
24	0732	110		100	12	16.1	1.0244	1.2
25	0721	10		42	24	16.7	1.0246	1.2
26	0702	none visible			24	16.1	1.0246	1.5
27	0702	none visible			24	16.1	1.0248	1.8
28	0718	90			12	16.4	1.0248	1.8
29	0903	40		45	94	16.7	1.0252	0.6
30	0942	35		45	104	16.4	1.0264	1.2
31	0838	50		44	122	14.5	1.0248	1.8

PART VI: WATER LEVELS

The National Ocean Services (NOS) has established a primary tide station (No. 865-1370) at the seaward end of the FRF pier. A Leupold-Stevens digital recording float-type tide gage is used to collect instantaneous water level data every 6 minutes throughout the month.

The variation in water level during the month is shown in Figure 4 along with a list of mean and extreme values. This presentation is useful in identifying effects of both meteorological and astronomical forces on the open coast water level.

Table 6 contains the time of the center of each sampling interval and the range, high, low, and mean water levels during each tidal cycle.

FRF Tide Heights

Oct 1988

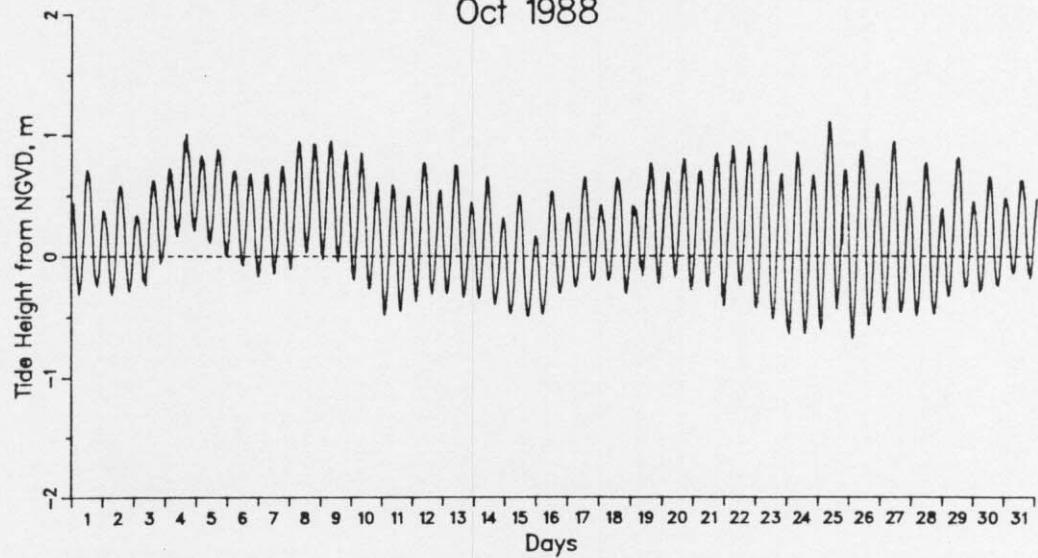


Figure 4. Water level time history

Monthly Water Levels, m NGVD

Extreme Low	=	-0.68	on day 26 at	106 hr
Extreme High	=	1.11	on day 25 at	618 hr
Monthly Mean	=	0.20		
Mean Low	=	-0.29		
Mean High	=	0.73		
Mean Range	=	1.02		

Table 6: Water Levels, m NGVD

		Oct 1988			
Mid-Cycle Day	Time	Low	High	Mean	Range
1	612	-0.31	0.71	0.17	1.02
1	1837	-0.25	0.64	0.13	0.89
2	703	-0.32	0.58	0.10	0.89
2	1928	-0.29	0.55	0.08	0.84
3	753	-0.24	0.62	0.15	0.86
3	2018	-0.06	0.73	0.30	0.79
4	843	0.16	0.96	0.51	0.80
4	2109	0.21	1.01	0.57	0.80
5	934	0.11	0.88	0.49	0.77
5	2159	0.01	0.85	0.41	0.84
6	1024	-0.08	0.70	0.31	0.79
6	2249	-0.17	0.68	0.26	0.85
7	1115	-0.14	0.74	0.29	0.88
7	2340	-0.11	0.94	0.37	1.05
8	1205	0.03	0.93	0.50	0.90
9	30	-0.03	0.93	0.47	0.96
9	1255	-0.05	0.95	0.44	1.01
10	121	-0.20	0.85	0.33	1.05
10	1346	-0.27	0.74	0.21	1.01
11	211	-0.48	0.59	0.05	1.07
11	1436	-0.46	0.51	0.06	0.97
12	301	-0.37	0.77	0.18	1.15
12	1527	-0.31	0.67	0.15	0.98
13	352	-0.31	0.75	0.20	1.06
13	1617	-0.34	0.58	0.09	0.92
14	442	-0.34	0.66	0.13	1.00
14	1707	-0.40	0.41	-0.01	0.81
15	532	-0.47	0.50	-0.01	0.98
15	1758	-0.50	0.30	-0.13	0.80
16	623	-0.48	0.53	-0.01	1.01
16	1848	-0.30	0.37	0.04	0.67
17	713	-0.25	0.65	0.16	0.90
17	1938	-0.20	0.47	0.13	0.67
18	804	-0.20	0.65	0.20	0.85
18	2029	-0.31	0.52	0.10	0.83
19	854	-0.17	0.77	0.28	0.94
19	2119	-0.23	0.69	0.25	0.91
20	944	-0.17	0.80	0.29	0.97
20	2210	-0.28	0.71	0.24	0.99
21	1035	-0.26	0.85	0.27	1.10
21	2300	-0.41	0.91	0.25	1.32
22	1125	-0.25	0.91	0.32	1.15
22	2350	-0.43	0.91	0.24	1.34
23	1216	-0.52	0.83	0.13	1.35
24	41	-0.64	0.86	0.07	1.50
24	1306	-0.64	0.77	0.08	1.41
25	131	-0.60	1.11	0.20	1.71
25	1356	-0.44	0.98	0.23	1.42
26	222	-0.68	0.87	0.08	1.55
26	1447	-0.57	0.79	0.08	1.36
27	312	-0.47	0.95	0.19	1.41
27	1537	-0.47	0.85	0.09	1.31
28	402	-0.49	0.77	0.09	1.26
28	1628	-0.48	0.66	0.01	1.13
29	453	-0.33	0.81	0.18	1.15
29	1718	-0.25	0.76	0.15	1.01
30	543	-0.29	0.66	0.15	0.95
30	1808	-0.25	0.59	0.14	0.84
31	634	-0.14	0.63	0.22	0.77
31	1859	-0.18	0.59	0.16	0.77

PART VII: NEARSHORE PROFILES

A. Nearshore Profiles. In order to document profile response away from the pier, surveys of four profile lines extending 900 to 1,000 m from shore and located 489 and 581 m north and 517 and 608 m south of the FRF pier are conducted bi-weekly, after storms, and during more complete bathymetric surveys.

These profiles are obtained using the CRAB-Zeiss surveying system; a Zeiss Elta-2 first-order, self-recording electronic theodolite distance meter in combination with the Coastal Research Amphibious Buggy (CRAB), a 10.7 m high, self-powered, mobile tripod on wheels.

Figure 5 shows the last survey in September and the survey in October on profile line 188, located 517 m south of the pier. The only significant change is the 80-m shoreward migration of the nearshore bar (160 to 300). Minor changes are visible on the remainder of the profile.

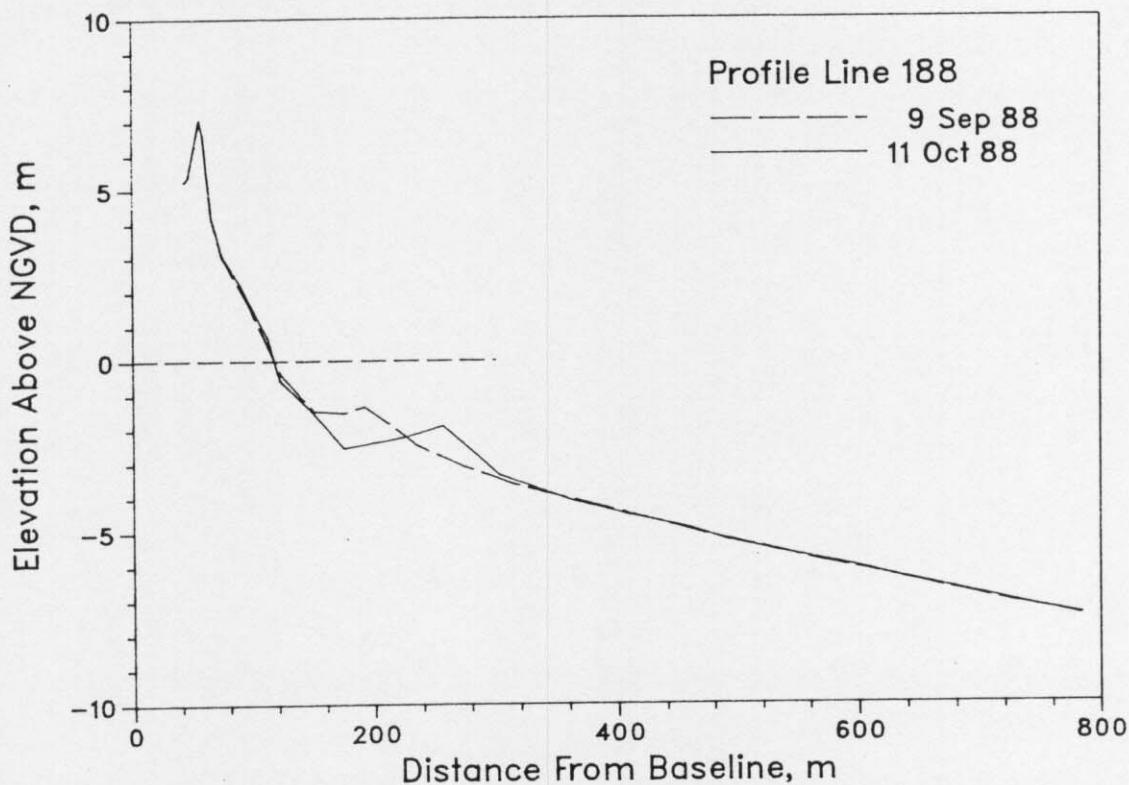


Figure 5. Monthly CRAB profiles on profile 188 -
517 m south of pier.

The profile envelope (Figure 6) reflects the maximum changes that occurred on the profile during 1988. The only change to the envelope occurs at the crest of the nearshore bar.

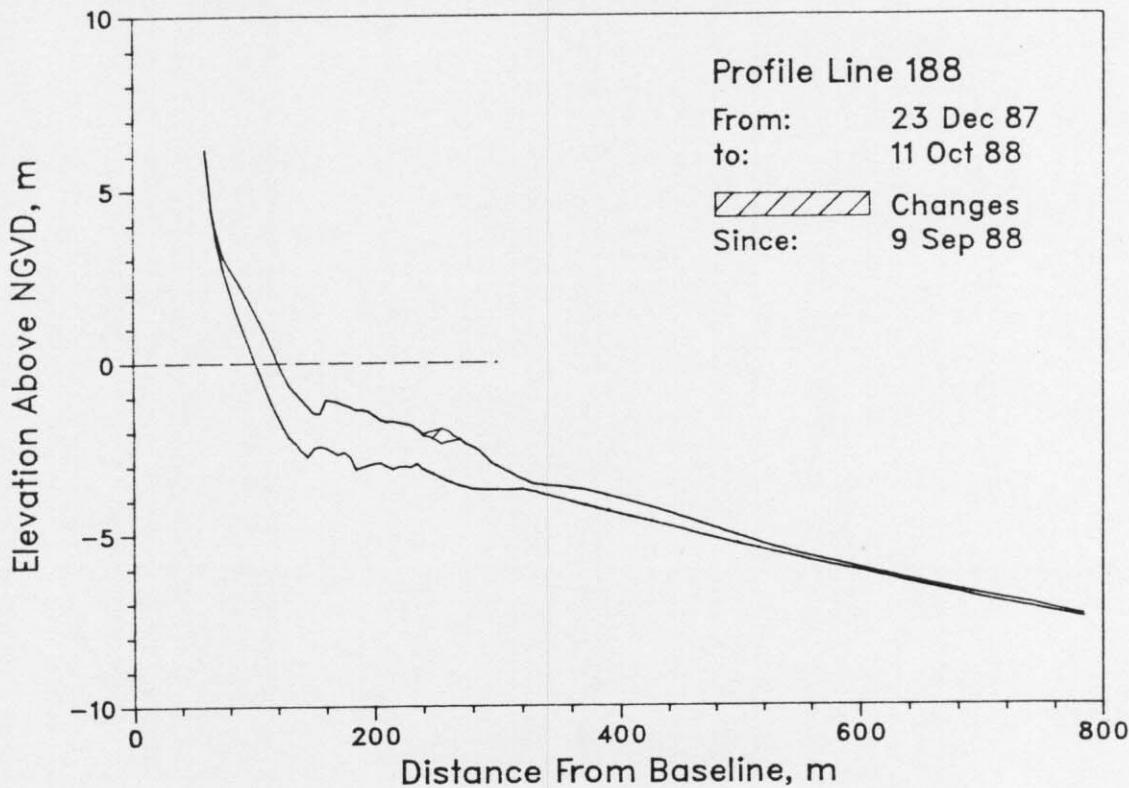


Figure 6. CRAB profile envelope - profile 188.

B. Bathymetry. Figure 7 includes a two- and three-dimensional contour map and a change plot derived from the bathymetric survey conducted on 9 September (no October bathymetric survey). Wide contour lines on the change diagram represent areas which eroded; thin lines indicate accretion.

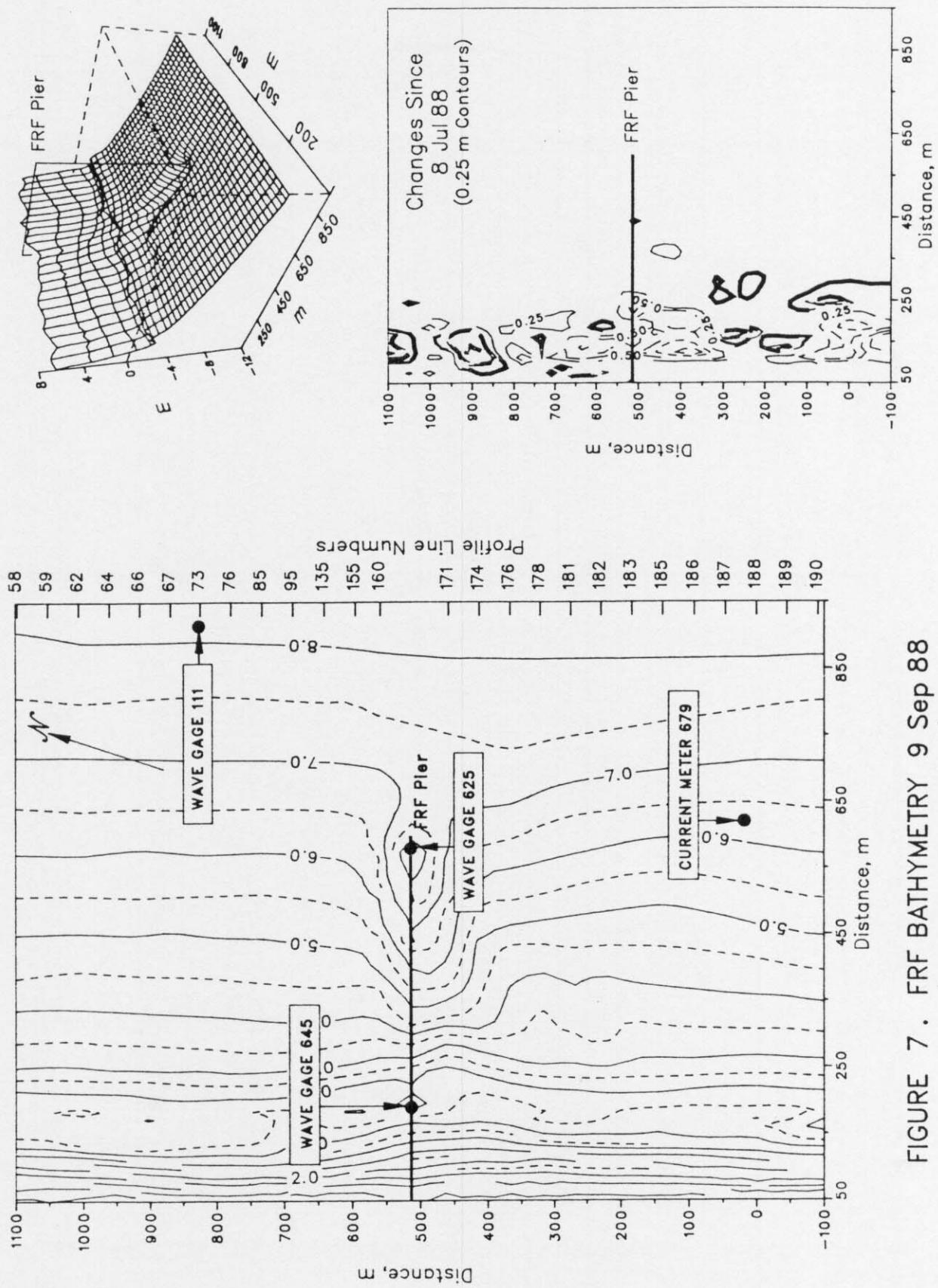


FIGURE 7. FRF BATHYMETRY 9 Sep 88
(Depths Relative to NGVD)

PART VIII: SPECIAL EVENTS

A. Storm Data Collection. The following list identifies times when the wave height at the seaward end of the pier (i.e. as measured by Gage 625 at pier station 19+00) exceeded 2 m. When this occurred, four contiguous 34-min wave records were obtained every three hours:

<u>Start</u>	<u>End</u>
4 Oct (0808)	4 Oct (2042)

B. Storm Synopsis.

4 October - On 3 October, this storm developed in the Gulf of Mexico off the Florida coast, quickly intensified as it moved up the eastern coast, and was located off Cape Hatteras, NC early on 4 October. By the morning of 5 October it was located off the New England coast. Maximum winds (from north-northeast) exceeding 16 m/sec peaked at 1000 EST on 4 October, and the maximum H_{mo} (Gage 625) of 2.29 m (period = 6.56 sec) was recorded at 0842 EST on the same day. The minimum barometric pressure of 1008 mb was recorded at 0700 EST on 4 October. Total precipitation was 25 mm.

8 October - Following the small storm on 4 October winds continued onshore. With the addition of a strong Canadian high pressure system on 7 October waves briefly exceeded 2 m. Maximum wind speeds (from north) recorded on 7 October exceeded 13 m/sec at 1334 EST; maximum H_{mo} of 2.07 m (period = 6.92 sec) at Gage 625 occurred at 0208 EST on 8 October.

Distribution List

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OCE	U.S. Geological Survey
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NAO	U.S. Naval Academy
NASA/Wallops Flight Center	U.S. Naval Civil Eng. Lab
NOAA (NOS, NWS)	U.S. Naval Fac. Eng. Com.
SAD	U.S. Naval Oceanographic Off.
SAW	U.S. Naval Research Lab

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